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ROHDE & SCHWARZ
MÜNCHEN

Manual

DC MICROVOLTMETER UIG

203.5111.02

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Drawings and Diagrams

1. Characteristics

1.1 Uses

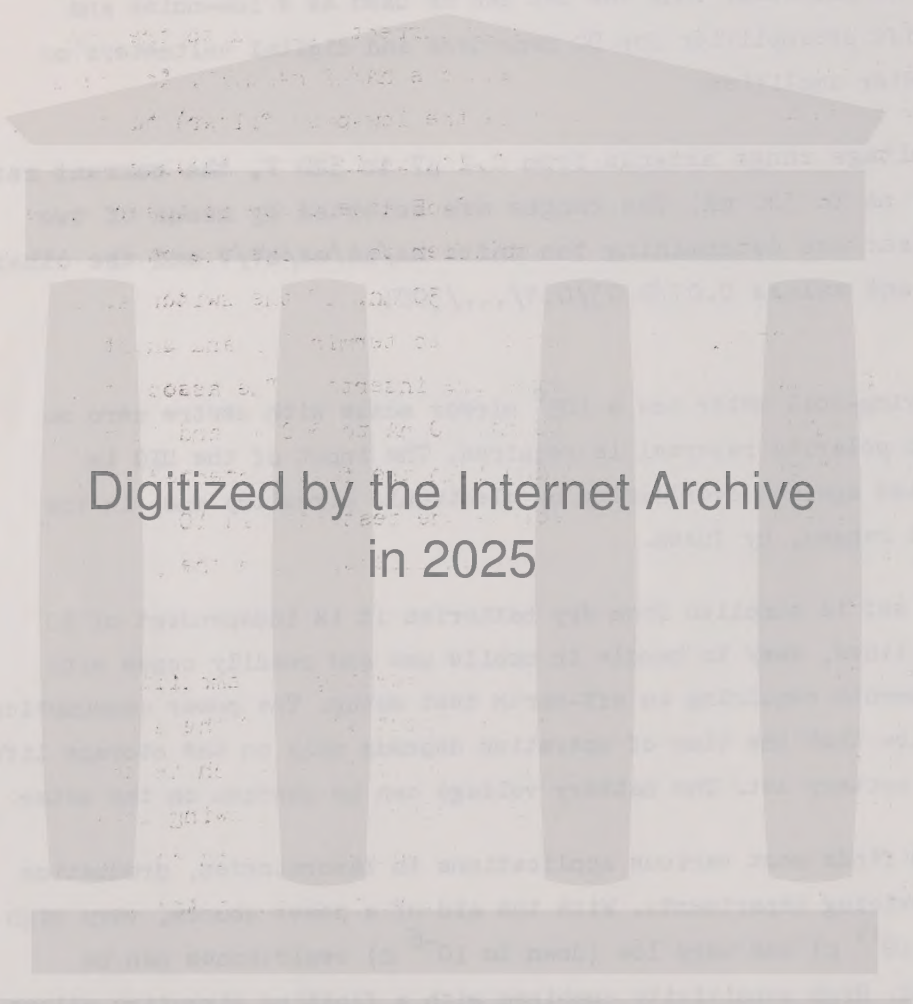
The DC Microvoltmeter Type UIG Ident No. 203.5111 is a very sensitive measuring instrument for DC voltages and DC currents. An amplifier output is provided. Thus the set can be used as a low-noise and low-drift preamplifier for DC recorders and digital voltmeters or as a meter amplifier.

The voltage range extends from 0.2 µV to 320 V, the current range from 1 pA to 320 mA. The ranges are selected by means of two switches: one determining the units nA/µA/mA/mV/V and the other range end values 0.01/0.03/0.1/.../300.

The moving-coil meter has a 105° mirror scale with centre zero so that no polarity reversal is required. The input of the UIG is protected against overloading by electronic circuitry and, in the current ranges, by fuses.

As the set is supplied from dry batteries it is independent of AC supply lines, easy to handle in mobile use and readily copes with measurements requiring an off-earth test setup. The power consumption is so low that the time of operation depends only on the storage life of the battery set. The battery voltage can be checked on the meter.

The UIG finds most various applications in laboratories, production and servicing departments. With the aid of a power source, very high (up to 10^{14} Ω) and very low (down to 10^{-6} Ω) resistances can be measured. High sensitivity combined with a floating circuitry allows the use as a null detector and tolerance indicator in bridge measurements.



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1.2 Description

See block diagram Fig. 1-1.

The DC Microvoltmeter UIG comprises two DC amplifiers, the first of which is a chopper. A resistance network provides negative feedback between the amplifiers. Range selection is achieved in the input circuit, the amplifier path and the feedback circuit.

The unknown quantity, voltage or current, is fed to the amplifier path via a switch which has the positions nA/µA/mA/mV/V. In the mV position, the amplifier is connected (via the low-pass filter) to terminal U, and the ranges 10 µV to 300 mV with an input resistance of 10 MΩ are obtained. In the V position, a 60-dB attenuator is inserted between the input terminal and the amplifier to realize the ranges 10 mV to 300 V with an input resistance of 50 MΩ. If the switch is at mA, µA or nA, the amplifier is connected to terminal J and shunt resistors of 1 Ω, 1 kΩ or 1 MΩ to common are inserted. The associated measurement ranges are 10 µA to 300 mA, 10 nA to 300 µA and 10 pA to 300 nA. The shunt resistors of 1 Ω and 1 kΩ are fuse-protected against overloading. The voltage drop across the test item is 10 µV to 300 mV in the current ranges; it can be read directly from the position of the range selector.

The three-section low-pass filter preceding the amplifier suppresses AC interference. The differential input stage of the amplifier transforms the DC voltage into a 87-Hz AC voltage, which is then amplified and applied to a synchronous rectifier. The following low-pass filter stabilizes the control circuit and reduces noise in the signal path. A 50-dB DC amplifier then passes the voltage on to the meter and to the front-panel output.

The output voltage is fed back to the second input of the differentiating stage via a switch-controlled attenuator. The switching of the feedback circuit is ganged with the gain switching of the AC amplifier in such a way that the gain of the complete circuitry changes in 10-dB steps, but the loop gain remains constantly 40 dB. The range end values are engraved on the front panel at the switch positions. The current and

voltage zeros of the amplifier can be adjusted on the front panel by means of a screwdriver and are thus independent of the output impedance of the test item.

The operating voltage supplied by the batteries is stabilized.

1.3 Specifications

Voltage range ..... 0 to ±320 V in 20 subranges

Subranges and input resistances R_{in}

mV position (R_{in} = 10 MΩ) ..... 10/30/100/300 µV/1/3/10/30/100/300 mV

V position (R_{in} = 50 MΩ) ..... 10/30/100/300 mV/1/3/10/30/100/300 V

Current range ..... 0 to ±320 mA in 30 subranges

Subranges and input resistances R_{in}

nA position (R_{in} = 1 MΩ) ..... 10/30/100/300 pA/1/3/10/30/100/300 nA

µA position (R_{in} = 1 kΩ) ..... 10/30/100/300 nA/1/3/10/30/100/300 µA

mA position (R_{in} = 1 kΩ) ..... 10/30/100/300 µA/1/3/10/30/100/300 mA

Test inputs ..... separate for voltage and current, unbalanced, floating; 4-mm knurled terminals

Maximum permissible voltages and currents

V position ..... 500 V

mV position ..... 300 V for 1 sec
70 V continuously

mA position ..... 1 A

µA position ..... 10 mA

nA position ..... 5 mA

Overload protection in the mA and µA positions ..... fuses

Insulation resistance between common and cabinet ..... $> 10^{10}$ Ω

Permissible voltage between common and cabinet ..... 500 V

Interference rejection at 50/60 Hz referred to E_{pp}

for interference voltages between common and cabinet (common-mode rejection) ..... > 130 dB (typical 150 dB)

for interference voltages between the test terminals (series-mode rejection)

Range	0.01	0.03	0.1	0.3	1
nA/µA/mA/mV positions	> 80 dB	> 70 dB	> 60 dB	> 60 dB	> 50 dB
V position	> 90 dB	> 90 dB	> 80 dB	> 70 dB	> 70 dB

Range	3	10	30	100	300
nA/µA/mA/mV positions	> 70 dB	> 60 dB	> 50 dB	> 50 dB	> 40 dB
V position	> 80 dB	> 70 dB	> 60 dB	> 60 dB	> 50 dB

Error limits of indication (without noise and drift)

Inherent error at 20°C

nA position ..... ±2.5% of f.s.d.

Other positions ..... ±1.5% of f.s.d.

Overall error in the temperature range +10 to +35°C

nA position ..... ±3.5% of f.s.d.

Other positions ..... ±2.5% of f.s.d.

Zero drift (due to temperature)

Voltage drift ..... ±0.2 µV/°C

Current drift ..... ±3 pA/°C

Fluctuation of reading (R_Q = resistance terminating the input)

V position ..... 0.3 mV (input open)

mV position ..... 0.3 µV (R_Q = 50 kΩ)
0.8 µV (R_Q = 1 kΩ)

mA position ..... 0.2 µA
µA position ..... 0.2 nA
nA position ..... 0.8 pA
} (input open)

Amplifier output

Circuit and connector ..... unbalanced, floating, short-circuit-proof; two 4-mm knurled terminals

Open-circuit voltage at the range end values (without noise and drift) ..... 1 V ±0.5% (±1.5% in nA position)

Response time for ≤ 1% deviation from f.s.d.

V position ..... < 0.7 sec (any R_Q)

mV position

range 0.01 to 0.03 ..... < 0.5 sec
0.1 to 300 ..... < 0.3 sec
} ($R_Q \leq 10$ kΩ)
0.01 to 300 ..... < 12 sec (R_Q = 1 MΩ)

mA position ..... < 0.3 sec
µA position ..... < 0.3 sec
} (any R_Q)
nA position ..... < 12 sec ($R_Q \gg 1$ MΩ)

Inherent noise E_{pp} in the most sensitive ranges

V position, range 0.01 ..... 50 mV (input open)

mV position, range 0.01 ..... 50 mV (R_Q = 50 kΩ)
150 mV (R_Q = 1 MΩ)

mA position, range 0.01 ..... 40 mV
µA position, range 0.01 ..... 40 mV
nA position, range 0.01 ..... 150 mV
} (input open)

General data

Power supply ..... +4.5/-4.5 V from dry cells

Ambient temperature

Nominal range ..... +10 to +45°C

Operating range ..... -20 to +60°C

Shelf temperature ..... -25 to +75°C

Warm-up period ..... 5 min

Dimensions (W x H x D) ..... 162 x 238 x 275 mm

Weight (with battery set) ..... 4 kg

1.4 Accessories Supplied

6 single cells, 1.5 V IEC-R20 Ident No. EB 017.0015

2 fuses M 0,02 C DIN 41571

3 fuses F 1 C, DIN 41571

2. Preparation for Use and Operation

2.1 Preparation for Use

2.1.1 Front-panel Controls

See Fig. 2-1.

No.	Engraving	Function
1		Meter with two scales and two blue tolerance marks for battery voltage check.
2		Screwdriver adjustment for setting the mechanical zero.
3	OFF/±BATT./OPER.	On-off switch for operating voltage and battery voltage check.
4	0.01/0.03/0.1/.../300 (U), (J)	Range selector. Positions for checking and adjusting electrical zeros.
5	U - 0 OUTPUT	Amplifier output referred to common.
6	⊥	Chassis connection
7	J - 0 INPUT	Input for current measurement (referred to common)
8	U - 0 INPUT	Input for voltage measurement (referred to common)
9	V (50 MΩ)/mV (10 MΩ)/ mA (1 Ω)/µA (1 kΩ)/ nA (1 MΩ) (U), (J)	Selector for unit of measurement (input resistance) Switch positions for checking and adjusting electrical zeros.

No.	Engraving	Function
10	(U) ZERO ADJ.	Adjustment for voltage zero.
11	(J) ZERO ADJ.	Adjustment for current zero.

2.1.2 Setting up

The set should be operated in an upright position (carrying handle on top) or slightly tilted back with the stand at the bottom swung out. Only then is the accuracy of the meter maintained.

2.1.3 Checking and Adjusting the Mechanical Zero of the Meter

When the set is switched off the pointer of the meter 1 must be at the zero point, which is at the scale centre.

Correction is possible with the screwdriver adjustment 2 .

2.1.4 Battery Check and Switching on

In the BATT. ± positions of switch 3 the voltage of the battery set can be checked. The pointer of meter 1 deflects to within the blue sectors if the battery voltage is sufficient.

The sum voltage of three single cells is measured in each check position. Twice the voltage value can be read on the upper scale. The numerical readings should be approximately equal in both check positions. If in either position the deflection is too small, then the battery set must be replaced (section 3.1.1).

The set is switched on by turning switch 3 to OPER. The error limits specified ir section 1.3 are maintained after a warm-up period of 5 minutes. With switch 3 at OFF the set is disabled.

The current consumption of the Microvoltmeter is 0.5 mA. This results in an operating time of 10,000 hours for the battery set. It is therefore not necessary to switch the UIG off for short intervals. If the set is not permanently operating the service life of the battery is mainly determined by its storage life.

2.1.5 Checking and Adjusting the Electrical Zeros of the Meters

This check should be preceded by an adjustment of the mechanical zero (section 2.1.3), battery check (section 2.1.4) and, if necessary, replacement of the battery set (section 3.1.1).

The Microvoltmeter should have been for at least two hours in a room with constant temperature ($\pm 2^{\circ}C$) and have run for at least 5 minutes. The current input 7 must be open.

Check and adjustment of current zero:

Set range selector 9 to nA.
Set range selector 4 to 0.01.
The pointer must stand at mid-scale.
Adjust, if necessary, with 11 using a screwdriver.
The switch positions and the adjustment screw are marked by the symbol (J).

Check and adjustment of voltage zero:

Set range selector 9 to mA.
Set range selector 4 to 0.01.
The pointer must stand at mid-scale.
Adjust, if necessary, with 10 using a screwdriver.
The switch positions and the adjustment screw are marked by the symbol (U).

As the two adjustments are slightly interdependent, it may be necessary to repeat them. The amplifier input is terminated with 1 Ω for the voltage adjustment (mA position) and with 1 MΩ for the current adjustment

(nA position). The separate adjustments for current and voltage (input open and shorted, respectively) ensure that the electrical zero is independent of the source impedance of the voltage source.

The voltage and current zeros vary temporarily upon a change in temperature. This variation will, however, affect only the most sensitive ranges. After about two hours thermal equilibrium exists again in the whole circuitry and the zero drifts disappear. A new adjustment should therefore be made only two hours after the temperature change.

2.1.6 Connection of Instruments to the Input and Output

The knurled terminals 7 and 8 are provided for current and voltage measurements. The amplifier output voltage is available at the knurled terminals 5 . The earthy point (common) is marked "0"; it is common to the inputs for current and for voltage measurement. The cabinet of the UIG is earthed via the telephone jack 6 (engraving: ⊥).

The connection to the test point is usually made with laboratory cables fitted with 4-mm banana plugs. Shielded cables should be used for measurements in the sensitive ranges (below 1 mV) on high-impedance sources (> 1 kΩ).

2.1.7 Earthing the Cabinet

The cabinet must be earthed in the following cases:

If the test voltage is greater than 40 V;
if the voltage between common and earth is greater than 40 V;

It should be noted that the test inputs and the amplifier output have a common circuit point (0). If a dangerous voltage (> 40 V) to cabinet appears at the 0 point of the input, the same voltage also exists in the output circuit.

2.2 Operation

2.2.1 General

As the UIG has its zero at mid-scale, the magnitude and sign of the measured quantity are indicated. The input resistances for the different ranges are engraved on the front panel. In the mV position of switch 9 the input resistance is 10 MΩ. The resistances 1 Ω, 1 kΩ, and 1 MΩ are associated with the mA, µA and nA ranges, respectively. The engravings around switch 4 indicate the voltage drop at the J terminals for the meter deflection 10 or 3.

The input impedance of the input low-pass filter is effective for AC voltages in the mV and nA ranges. It can be represented by an equivalent series circuit of a 10-kΩ resistance and a 1-µF capacitance. If this loading of the test item disturbs the measurement, for example, on amplifiers, a resistor of, say, 100 kΩ may be connected to the U terminal for decoupling. This causes a measurement error of 1% in the mV range. The input low-pass filter suppresses interference voltages of AC supply or higher frequency.

2.2.2 Test Setup

The UIG is completely off earth thanks to battery operation. As the cabinet is isolated from the circuitry and has no connection to earth through an AC supply, an earth connection should be provided in the test setup. If dangerous voltages are measured, such an earth connection is indispensable for reasons of safety (see section 2.1.7). In sensitive measurements, the cabinet earthing prevents hum pickup and electrostatic charging and avoids body effects in the test circuit.

When a load is connected to the amplifier output, it must be borne in mind that the input and output have a common circuit point (0). The floating condition of the test input is therefore affected by any instrument connected to the amplifier output. Small error limits make the UIG suitable for use as a preamplifier, say, for a digital voltmeter or DC recorder.

If the test circuit is unbalanced to earth, the common point (0) of the test input must be connected to the earthy pole of the source. Interference is minimized if the cabinet (socket 6) is connected to the earth point of the test circuit.

The response time of the instrument is determined by the input low-pass filter. In the mV and nA positions, it depends on the source impedance of the test item, whereas it is independent thereof in the V, mA and µA positions.

The inputs are protected against overloading by an electronic circuit and, in the mA and µA ranges, additionally by fuses. The amplifier output is short-circuit-proof.

2.2.3 Use as a Preamplifier

An open-circuit voltage of ±1 V is available at the amplifier output with a meter deflection of 10 or 3. The output impedance is 1 kΩ. Maximum gain of 100,000 or 100 dB is obtained in the 10-µV range. The gain can be switched in 10-dB steps with switch 4 and in 60-dB steps with switch 9. The total coverage is -50 dB to +100 dB.

In the current ranges, the UIG can be operated as a current/voltage transformer. For the use as a preamplifier it is important to bear in mind that the inputs and the output have a common circuit point (0) (see section 2.2.2).

3. Maintenance and Repair

3.1 Electrical Maintenance

3.1.1 Replacing the Battery Set

Remove the Microvoltmeter from its cabinet (loosen 4 screws on the front panel) and remove the plastic cover closing the battery compartment at the rear (loosen two screws). Engraved symbols show the positions in which the six new batteries are to be inserted. Only batteries of high quality and long storage life should be used.

Check the battery voltage with switch 3, screw the plastic cover on and put the chassis back into the cabinet.

3.1.2 Correcting the Zero Adjustment Range J

Due to extraordinary fluctuations in ambient temperature or to aging it may be possible that the range of variation of potentiometer 11 is no longer sufficient to compensate for the current drift. If so, take the chassis out of its cabinet (see above) and adjust the multi-turn potentiometer R10 which is accessible with a screwdriver through a hole in the left side panel.

Set the wiper of 11 to centre position, set switches 4 and 9 for 0.01 nA and vary R10, with the input terminals open, so as to bring the pointer of the meter to the mechanical zero. It is necessary to cover the interior of the set since incident light would produce unwanted currents in the semiconductor elements and thus disturb the adjustment.

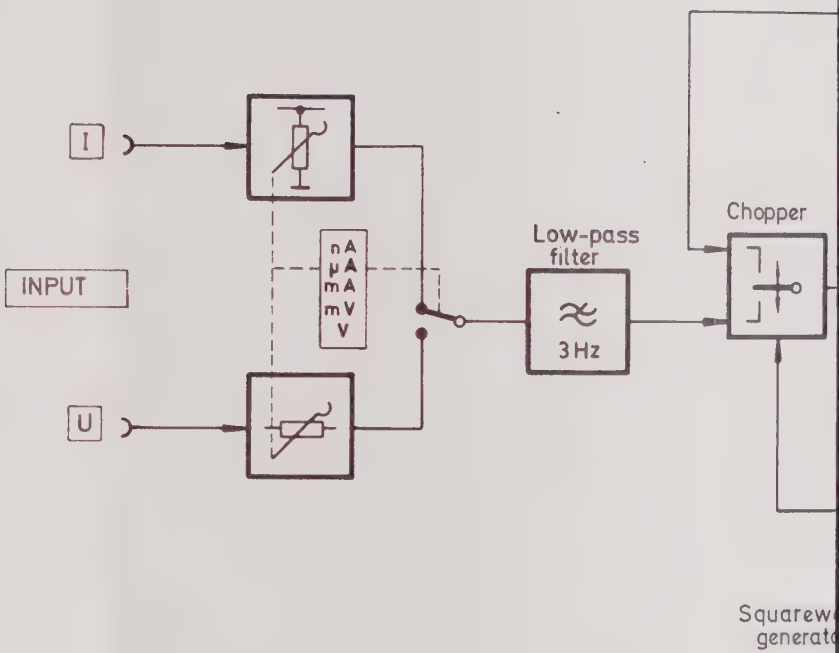
Put the set back into the cabinet and adjust the electrical zeros according to section 2.1.5.

3.2 Electrical Repair

3.2.1 Replacing the Fuses

The shunt resistors 1 Ω (mA position) and 1 kΩ (µA position) are protected by fuses.

To replace a fuse, take the set out of its cabinet as described in section 3.1.1. The fuses are retained in spring-loaded holders on the lower side. Spare fuses are stored in a holder on the side panel of the set. Be sure to use the M 0,02 C fuse for Si1 and the F 1 C for Si2.


I
U
INPUT
nA
µA
mA
mV
V
Low-pass
filter
3 Hz
Chopper

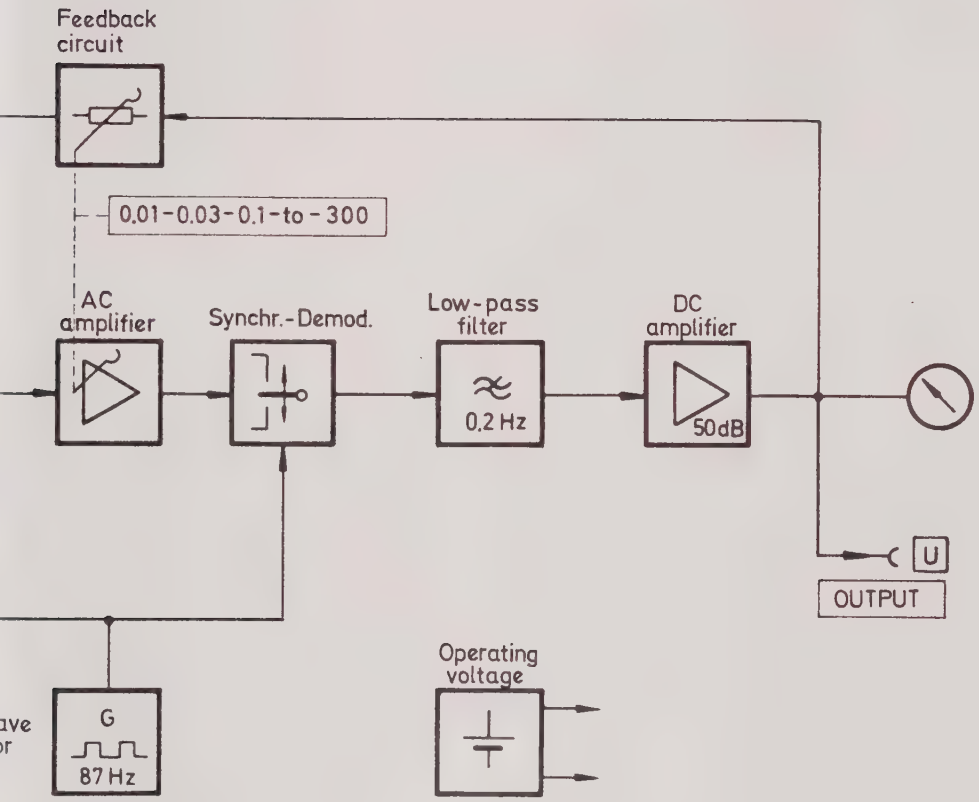


Fig. 1-1 Block diagram

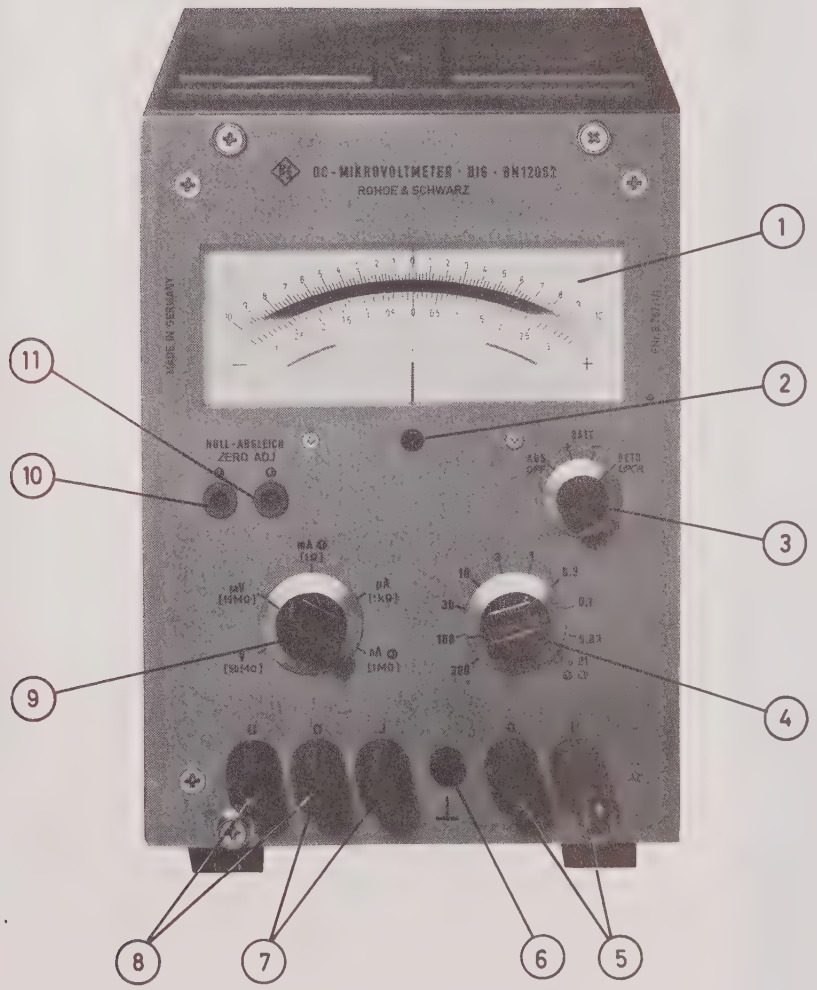


Fig. 2-1 Front-panel controls

R 23038 Bl. 21

Translations for Circuit Diagrams

Alle Gleichspannungen sind hochohmig ($R_E \geq 10$ MΩ) gegen ⊥ gemessen	All DC voltages are measured to ⊥ with high-resistance meter ($R_{in} \geq 10$ MΩ)
Anzeige	Indication
Anzeigespannung	Indication voltage
AUS	OFF
Ausgang	Output
Bandpaß-Zwischenverstärker	Band-pass amplifier
Batterie	Battery
Batteriespannung	Battery voltage
Die Eintragung der elektrischen Werte von Bauelementen ist unverbindlich. Genaue Werte siehe Schaltteilliste.	No responsibility is accepted for errors in component values. Accurate values are given in the parts list.
DC-Mikrovoltmeter	DC Microvoltmeter
EIN	ON
Eingangsverstärker	Input amplifier
Eingangs-Wahlschalter	Input selector
Endverstärker	Final amplifier
Funktionsstromlauf zu	Functional diagram of
Gegentakt-Treiberverstärker	Push-pull driver amplifier
Gegentakt-Treiberstufe	Push-pull driver stage
Gleichspannungsverstärker	DC amplifier
J-Abgleich grob	Coarse adjustment
Meßbereichschalter	Range selector
Meßzerhacker	Chopper
Nach R & S Vorschrift ausgesucht	Selected acc. to R&S specification
Nullabgleich	Zero adjustment

Regelstrecke	Stabilization
Regenteil	Stabilizing circuit
Siebung und Begrenzung	Filtering and limiting
Stromlauf zu	Circuit diagram of
Synchron-Gleichrichter	Synchronous rectifier
Temperatur-Kompensation	Temperature compensation
Tiefpaß	Low-pass filter
Vergleichsspannung	Reference voltage
vom Meßzerhacker	From chopper
vom Wechselspannungsverstärker	From AC amplifier
Wechselspannungsverstärker	AC amplifier
Werte für Vollausschlag Instrument J 1 im Meßbereich "x 300"	Values for f.s.d. of meter J 1 in range x 300
Zeichn. Nr.	Drawing No.
Zerhacker-Schaltspannung	Chopper voltage
zum Bereichsschalter	To range selector
zum Nullabgleich	To zero adjustment
Zum Synchron-Gleichrichter im Endverstärker (Y2) ($U_{A\ max} = \pm 3$ mV gegen $\perp$)	To synchronous rectifier in final amplifier (Y2) ($E_{out\ max} = \pm 3$ mV to $\perp$)

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Schaltteillisten
numerisch geordnet
Parts lists
in numerical order

R 29500 Bl. 3

R&S-Schlüsselliste

Die R&S-Schaltteillisten nennen in der Spalte "Benennung/Beschreibung" die technischen Daten der Bauelemente in Kurzform. Die Art des Bauelements (z. B. Schicht-, Draht-Widerstand usw.) beschreiben die 2 Kennbuchstaben vor der "Benennung" (evtl. auch vor der "Sachnummer"), die nachfolgend erklärt werden. In Ersatzteil-Bestellungen an R&S ist stets die Angabe der vollständigen Sachnummer erforderlich

R&S key list

The R&S Parts Lists give the technical data of the components in short form in the column "Benennung/Beschreibung" (designation). The type of component (e.g. depos.-carbon resistor, wire-wound resistor etc.) is indicated by 2 identification letters before the designation, possibly also before the "Sachnummer" (order number), which are explained below. When ordering spare parts from R&S, the complete order number must always be specified

Liste des symboles de référence R&S

La colonne «Désignation/description» des listes de pièces de R&S indique les caractéristiques des éléments sous forme abrégée. Le type d'élément (p. ex. résistance à couche, résistance bobinée etc. . .) est décrit par les deux lettres précédant la désignation (et éventuellement le numéro de référence), dont voici l'explication. Prière d'indiquer le numéro de référence («Sachnummer») complet dans toute commande de pièces de rechange.

Kenn-buchst	Art des Bauelementes	Identif.-letter	Type of component	Sym-bole	Type d'élément
A	**Aktive Bauelemente, Halbleiter**	**A**	**Active components, semiconductors**	**A**	**Composants actifs, semiconducteurs**
AD	Universaldiode, z.B. Gleichrichter, Sperrdiode	AD	General-purpose diode, e.g rectifier, high-resistance diode	AD	Diode d'usage général, p.ex redresseur, diode à haute resistance
AE	Spezialdiode, z.B. Tunnel-, Kapazitäts-, Zener-Diode	AE	Diode (special), e.g. tunnel diode, varactor, Zener diode	AE	Diode spéciale, p.ex. diode tunnel, varactor, diode Zener
AF	Fotoelement, z.B. Foto-Diode, -Transistor, -Widerstand, Leucht-diode	AF	Ligth-sensitive component, e.g. resistor, diode, transistor; LED	AF	Composant photoélectrique, p.ex diode, transistor, resistance photoél., D.E.L
AG	Leistungs-Gleichrichter, z.B. Thyristor, Triac, Selengleichrichter	AG	Power rectifier, e.g. thyristor, triac, selenium rectifier	AG	Redresseur de puissance, p.ex thyristor, triac, redresseur au sélénium
AK	Kleinsignal-Transistor	AK	Low-power transistor	AK	Transistor faible puissance
AL	Leistungs-Transistor	AL	High-power transistor	AL	Transistor grande puissance
AM	Spezial-Transistor, z.B. FET, MOSFET	AM	Transistor (special), e.g. FET, MOS-FET	AM	Transistor spécial, p.ex. TEC, MOSTEC
AP	Peltier-, Hall-Element	AP	Peltier element, Hall element	AP	Element Peltier, élement Hall
AR	Röhre für Empfänger, Verstärker, Gleichrichter	AR	Valve for receiver, amplifier, rectifier	AR	Tube pour récepteur, amplificateur, redresseur
AS	Spezialröhre, z.B. Senderöhre, EW-Widerstand, Stabilisator	AS	Valve (special), e.g. for transmitter; baretter, ballast valve	AS	Tube (spécial), p.ex. pour émetteur, résistance fer-hydrogène, ballast
AT	Katodenstrahlröhre, z.B. Bildröhre, Ziffern-Anzeigeröhre	AT	Cathode ray tube, e.g. picture tube, digital indicator tube	AT	Tube à rayon cathodique, p.ex. tube à image, tube à affichage numérique
AW	Spannungs- oder temperaturabhängiger Widerstand	AW	Voltage- or temperature-dependent resistor	AW	Varistance ou thermistance
B	**Bausteine**	**B**	**PC boards, chips**	**B**	**Cartes imprimées, puces**
BC	Integr. Schaltkreis (Microcomp.)	BC	Integrated circuit (interface, A/D)	BC	Circuit intégré (microprocesseur)
BD	R&S-Dünnschichtschaltung	BD	R&S thinfilm circuit	BD	Circuit à couche mince R&S
BG	Gerätebaugruppe	BG	Subassembly	BG	Sous-ensemble
BJ	Integr. Schaltkreis (Interface, A/D-Wandler)	BJ	Integrated circuit (interface, A/D converter)	BJ	Circuit intégré (interface, convertisseur A/N)
BK	Kernspeicher, Magnetspeicher	BK	Core memory, magnetic memory	BK	Mémoire à tores, mémoire magnétique
BL	Log. Schaltkreis z.B. DTL, TTL, HTL, ECL, C-MOS	BL	Logic circuit, e.g. DTL, TTL,HTL, ECL, C-MOS	BL	Circuit logique, p.ex. DTL,TTL, HTL, ECL, C-MOS
BM	Hybridbaustein, z.B. Mischer, Tuner, Modulator	BM	Hybrid chip, e.g. mixer, tuner, modulator	BM	Puce hybride, p.ex. mélangeur, tuner, modulateur
BO	Analogschaltkreis, z.B. Operations-verstärker	BO	Analog circuit, e.g. operational amplifier	BO	Circuit analogique, p.ex. amplificateur opérationnel
BP	Optobaustein, z.B. Anzeigeeinheit, Koppler	BP	Optoelement, e.g. display, coupler	BP	Elément optique, p ex afficheur coupleur
BS	Schalt- und Steuerbaustein, elektronischer Sensor	BS	Switching and control modul, electronic sensor	BS	Modul de commutation et de commande, sonde électronique
BV	Stromversorgung, Übersp -Schutz	BV	Power pack, protective circuit	BV	Alimentation, protection surcharge

Kenn-buchst.	Art des Bauelementes	Identif.-letter	Type of component	Sym-bole	Type d'élément
C	**Kondensatoren**	**C**	**Capacitors**	**C**	**Condensateurs**
CB	Bypass-, Durchf.-Kondensator	CB	Bypass capacitor, feed-through capacitor	CB	Condensateur bypass, condensateur de traversée
CC	Keramischer Kondensator	CC	Ceramic capacitor	CC	Condensateur céramique
CD	Drehkondensator	CD	Variable capacitor	CD	Condensateur variable
CE	Elektrolytkondensator	CE	Electrolytic capacitor	CE	Condensateur électrolytique
CG	Glimmerkondensator	CG	Mica capacitor	CG	Condensateur au mica
CH	Sperrschichtkondensator	CH	Semiconductor capacitor	CH	Condensateur semiconducteur
CK	Kunstfolienkondensator	CK	Synthetic-foil capacitor	CK	Condensateur à feuille synthétique
CL	Ker. Hochsp.-Kondensator	CL	HV capacitor (ceramic)	CL	Condensateur HT céramique
CM	Metallpapier-Kondensator	CM	MP capacitor	CM	Condensateur à papier métallisé
CN	Kondensatornetzwerk	CN	Capacitor network	CN	Réseau capacitif
CP	Papierkondensator	CP	Paper capacitor	CP	Condensateur au papier
CS	Störschutzkondensator	CS	Interference-suppression capacitor	CS	Condensateur anti-parasite
CT	Trimmkondensator	CT	Trimmer capacitor	CT	Condensateur ajustable
CV	Vakuum-Kondensator	CV	Vacuum capacitor	CV	Condensateur à vide
D	**Drähte, Leitungen**	**D**	**Wires, lines**	**D**	**Fils, lignes**
DD	Schalt- und Wickeldraht	DD	Hook-up or winding wire	DD	Fil de câblage, fil de bobinage
DF	Flachleitung, Litze	DF	Flat multiple line, stranded wire	DF	Ligne plate, ligne torsadée
DG	Abgeschirmte Leitung	DG	Shielded line	DG	Ligne blindé
DH	Koaxialkabel	DH	Coaxial line	DH	Ligne coaxiale
DN	Antenne	DN	Antenna	DN	Antenne
DS	Anschlußkabel (mehradrig)	DS	Connecting cable, multicore	DS	Câble de connexion (multiconducteur)
E	**Elektrische Teile**	**E**	**Electric parts**	**E**	**Organes électriques**
EB	Blei-, NC-Akku, Batterie	EB	Lead or alkaline accumulator, battery	EB	Accumulateur Pb/NC, batterie
EF	Glühlampe, Leuchte	EF	Incandescent lamp, pilot lamp	EF	Lampe à incandescence, voyant
EG	Glimmlampe, Entladungslampe	EG	Glow lamp, discharge lamp	EG	Lampe à luminescence, lampe à décharge
EK	Kontakt-Streifen, -Feder	FK	Contact clip, contact spring	EK	Lame de contact, ressort de contact
EL	Lautspr., Kopfhörer, Mikrofon	EL	Loudspeaker, headphones, microphone	EL	Haut-parleur, casque, microphone
EM	Motor, Hubmagnet, Drehfeldsystem	EM	Motor, lifting magnet, synchro system	EM	Moteur, électro- aimant de levage, système synchro
EO	Oszillator, z.B. Quarzoszillator	EO	Oscillator, e.g. crystal oscillator	EO	Oscillateur, p.ex. oscillateur à quartz
EP	Tief-, Band-, Hochpaß, Bandsperre, Diskriminator	EP	Lowpass, bandpass, highpass filter, band-stop filter, discriminator	EP	Filtre passe-bas, passe-bande, passe-haut, suppression de bande, discriminateur
EQ	Schwing-, Filter-Quarz	EQ	Oscillator or filter crystal	EQ	Quartz oscillateur, quartz de filtre
ER	Resonator, piezoelektr./ magnetostriktiv	ER	Resonator, piezoelectric/ magnetostrictive	ER	Résonateur piézo-électrique/ magneto-strictif
ES	Passive SHF-Bauteile	ES	Passive SHF-components	ES	Composant SHF passif
ET	Thermostat	ET	Thermostat	ET	Thermostat
EV	Lüfter, Gebläse	EV	Ventilator, blower	EV	Ventilateur, soufflerie
F	**Fassungen, Steckverbindungen**	**F**	**Sockets, connectors**	**F**	**Douilles, connecteurs**
FA	Dezifix/Prezifix A	FA	R&S coaxial connector Dezifix/Precifix A	FA	Dezifix, Prezifix A
FB	Dezifix B	FB	R&S coaxial connector Dezifix B	FB	Dezifix B
FC	Dezifix C	FC	R&S coaxial connector Dezifix C	FC	Dezifix C
FD	Dezifix D	FD	R&S coaxial connector Dezifix D	FD	Dezifix D
FE	Dezifix E/J	FE	R&S coaxial connector Dezifix E/J	FE	Dezifix E/J
FF	Dezifix F	FF	R&S coaxial connector Dezifix F	FF	Dezifix F

Kenn-buchst	Art des Bauelementes	Identif-letter	Type of component	Sym-bole	Type d'élément
FG	Koax-Umrüstsatz	FG	Coaxial screw-in assembly	FG	Ensemble vissable coaxial
FH	Koax-Übergang auf Fremdsystem	FH	Coaxial adapter	FH	Adaptateur coaxial
FJ	BNC-Systemteil	FJ	BNC srew-in assembly	FJ	Ensemble vissable BNC
FK	Koaxial-UHF-Systemteil	FK	Coaxial UHF screw-in assembly	FK	Ensemble vissable coaxial UHF
FM	Mehrfachstecker, Buchsenleiste	FM	Multipoint connector	FM	Connecteur multiple
FN	Netz-Steckverbindung	FN	AC-supply connector	FN	Connecteur secteur
FO	Runde Mehrfach-Steckverbindung	FO	Round multipoint connector	FO	Connecteur multipoles rond
FP	Druckschalt.-Steckverbindung	FP	Multipoint connector for PC boards	FP	Connecteur multipoles pour cartes imprimées
FR	Fassung für Lampe, Sicherung, usw.	FR	Socket for lamp, fuse, etc.	FR	Douille pour lampe, fusible etc
FT	Schwachstrom-Steckverbindung	FT	LV plug and socket	FT	Connecteur pour faible courant
FU	Hochsp.-Steckverbindung	FU	HV plug and socket	FU	Connecteur pour haute tension
FV	Verbinder (z.B. AMP)	FV	Push-on connector	FV	Connecteur à enfichage
J	**Meßinstrumente**	**J**	**Indicators**	**J**	**Indicateurs**
JD	Drehspul-Anzeigeinstrument	JD	Moving-coil meter	JD	Galvanomètre à cadre mobile
JE	Dreheisen-Anzeigeinstrument	JE	Moving-iron meter	JE	Galvanomètre à fer mobile
JF	Frequenzmesser	JF	Frequency meter	JF	Fréquencemètre
JG	Drehspulinstrument mit Gleichrichter	JG	Moving-coil meter with rectifier	JG	Galvanomètre à cadre mobile avec redresseur
JH	Betriebstundenzähler	JH	Operating-hours counter	JH	Compteur d'heures de fonctionnement
JJ	Impulszähler	JJ	Pulse counter	JJ	Compteur d'impulsions
JK	Kleinst-Instrument, z.B. Abstimmanzeiger	JK	Mini-instrument, e.g. tuning indicator	JK	Petit indicateur, p.ex. indicateur d'accord
JM	Mechanisches Zählwerk	JM	Mechanical counter	JM	Compteur mécanique
JP	Projektions-Instrument (Leuchtziffer)	JP	Digital display	JP	Afficheur numérique
JQ	Quotientenmesser (Kreuzspul-instrument)	JQ	Ratiometer (cross coil)	JQ	Quotientmètre (à cadres croisés)
JS	Spiegelgalvanometer	JS	Reflecting galvanometer	JS	Galvanomètre à mirroir
JU	Uhrwerk	JU	Clockwork	JU	Mouvement d'horlogerie
JW	Elektrodyn. Anzeigeinstrument	JW	Electrodynamic meter	JW	Instrument électrodynamique
L	**Induktivitäten, Magnetik**	**L**	**Inductors, magnetic components**	**L**	**Composants inductifs et magnétiques**
LC	Keramische Spule	LC	Ceramic coil	LC	Bobine céramique
LD	Netz-, HF-Drossel, Df-Filter	LD	Choke, lead-through filter	LD	Self de choc, filtre de traversée
LE	Einzelkreis, Bandfilter	LE	Single tuned circuit, bandpass filter	LE	Circuit accordé, filtre passe-bande
LP	Permanentmagnet	LP	Permanent magnet	LP	Aimant permanent
LT	Netztransformator	LT	Power transformer	LT	Transformateur secteur
LU	NF-Übertrager	LU	AF transformer	LU	Transformateur BF
LV	Variometer	LV	Variometer	LV	Variomètre
R	**Widerstände**	**R**	**Resistors**	**R**	**Résistances**
RD	Drahtwiderstand	RD	Wire-wound resistor	RD	Résistance bobinée
RF	Kohleschicht-Widerstand	RF	Carbon-film resistor	RF	Résistance à couche de carbone
RG	Metallglasur-Widerstand	RG	Metal-coated resistor	RG	Résistance à couche métallique
RJ	Metalloxyd-Widerstand	RJ	Metal-oxide resistor	RJ	Résistance à oxyde métallique
RL	Metallfilm-Widerstand	RL	Metal-film resistor	RL	Résistance à film métallique
RM	Widerstandsdraht	RM	Resistance wire	RM	Fil de résistance
RN	Widerstandsnetzwerk	RN	Resistor network	RN	Réseau de résistance
RR	Draht-Potentiometer	RR	Wire-wound potentiometer	RR	Potentiomètre bobiné
RS	Schicht-Potentiometer	RS	Carbon-film potentiometer	RS	Potentiomètre à couche

Kenn-buchst	Art des Bauelementes	Identif.-letter	Type of component	Sym-bole	Type d'élément
RT	Dämpfungsglied, Abschluß-widerstand	RT	Attenuator, termination	RT	Atténuateur, charge
RV	Drahtwiderstand mit Abgriff	RV	Wire-wound resistor, tapped	RV	Résistance bobinée à prise
RW	Wendelpotentiometer	RW	Helical potentiometer	RW	Potentiomètre hélicoidal
S	**Schalter, Relais, Sicherungen**	**S**	**Switches, relays, fuses**	**S**	**Commutateurs, relais, fusibles**
SB	Drucktastenschalter	SB	Pushbutton switch	SB	Commutateur à touche
SD	Drehschalter	SD	Rotary switch	SD	Commutateur rotatif
SF	Kontaktfedersatz	SF	Spring contact assembly	SF	Jeu de ressorts de contact
SH	HF-Koaxialschalter, -Relais, -Teiler	SH	Coaxial RF switch, RF relay, RF attenuator	SH	Commutateur RF coaxial, relais RF, atténuateur RF
SK	Kipp-, Wipp- und Schiebeschalter	SK	Toggle switch, slide switch	SK	Commutateur à bascule, à glissière
SL	Leistungsschalter Netz/HF	SL	AC supply switch, high-power RF switch	SL	Commutateur secteur, de puissance RF
SM	Mikroschalter	SM	Microswitch	SM	Microrupteur
SN	Elektromagnet, Relais	SN	Electromagnetic relay	SN	Relais électromagnétique
SP	Leistungsrelais, Luftschütz	SP	Power relay, air-type contactor	SP	Relais de puissance, contacteur à air
SR	Reedrelais	SR	Reed relay	SR	Relais reed
SS	Sicherung, Schutzschalter	SS	Fuse, automatic cut-out	SS	Fusible, coupe-circuit automatique
ST	Thermoschalter	ST	Thermal circuit breaker	ST	Disjoncteur thermique
SU	Überspannungs-Ableiter	SU	Arrester	SU	Eclateur
SW	Wechselrichter, Näherungsschalter	SW	Inverter (DC-AC), proximity switch	SW	Inverseur (DC-AC), commutateur de proximité
SZ	Zeitschalter	SZ	Time switch	SZ	Interrupteur horaire
V	**Verbindungselemente**	**V**	**Connecting elements**	**V**	**Eléments de raccordement**
VK	Klemme, Klemmleiste	VK	Clamp, terminal strip	VK	Pince, réglette à bornes
VL	Lötöse, Stützpunkt	VL	Soldering lug	VL	Cosse à souder
VS	Schraube, Mutter, Scheibe	VS	Screw, nut, washer	VS	Vis, écrou, disque

Farbcode für Widerstände und Kondensatoren / Colour code for resistors and capacitors / Code couleur pour résistances et condensateurs

Anmerkung:
Die Wertangabe der weitgehend miniaturisierten Bauelemente erfolgt überwiegend durch Farbkennzeichnungen, deren Bedeutung der nachfolgenden Tabelle entnommen werden kann.

Note:
The electrical values of the largely miniaturized components are mainly identified by a colour code, the meaning of which can be taken from the table below.

Remarque:
Les valeurs électriques des composants fort miniaturisés sont indiquées dans la plupart des cas par un code couleur dont voici l'explication.

HINWEIS:
Im Zuge des technischen Fortschrittes setzt R&S zunehmend Metallschichtwiderstände mit 1% Toleranz anstelle von Kohleschichtwiderständen mit 5% Toleranz ein. Metallschichtwiderstände können sich dabei an Stellen befinden, an denen gemäß Schaltteilliste Kohleschichtwiderstände vorgesehen sind. Etwaige geringfügige Differenzen der Nennwerte zwischen Stromlaufplan, Schaltteilliste und Gerät liegen im zulässigen Toleranzbereich.

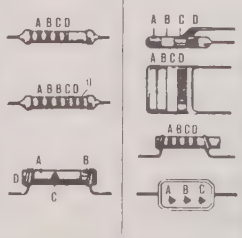
N. B.:
Following the state of the art R&S makes increasing use of metal-film resistors (1% tolerance) instead of carbon-film resistors (5% tolerance). Metal-film resistors may have been employed where carbon-film resistors are specified in the parts list. Any slight differences of nominal values between circuit diagram, parts list and equipment are within tolerance

N. B.:
Suivant le progrès technique R&S utilise de plus en plus des résistances à film métallique (tolérance 1%) au lieu des résistances à couche de carbone (tolérance 5%). Des résistances à film métallique peuvent se trouver en des points où des types à couche de carbone figurent dans la liste des composants. Les différences minimes des valeurs nominales existant éventuellement entre le schéma de circuit, la liste des composants et l'appareil sont dans la marge de tolérance.

Farbe/Colour/Couleur	A	B	C	D
Schwarz/Black/Noir	-	0		
Braun/Brown/Marron	1	1	0	± 1%
Rot/Red/Rouge	2	2	00	± 2%
Orange/Orangé	3	3	000	
Gelb/Yellow/Jaune	4	4	0000	
Grün/Green/Vert	5	5	00000	± 0.5%
Blau/Blue/Bleu	6	6	000000	
Violett/Violet	7	7	-	± 0.1%
Grau/Gray/Gris	8	8		
Weiß/White/Blanc	9	9		
Gold/Doré	-	-	-	± 5%
Silber/Silver/Argenté				± 10%
Ohne Farbe/No colour/ Pas de couleur				± 20%

Anordnungsbeispiele für Examples for Exemple pour

Widerstände (R)	Kondensat (C)
Resistors (R)	Capacitors (C)
Résistance (R)	Condensateur (C)



1) Toleranzring, hier nicht spezifiziert
1) Tolerance ring, here not specified
1) Anneau de tolérance, ne pas spécifié ici

Definition* / Définition*

Kennzeichen A Marking A Repérage A	(Bauteilfarbe/1. Farbring) = 1. Zahl; (body colour or first coloured ring) = 1st digit; (couleur du corps ou 1er anneau) = 1er chiffre;
Kennzeichen B Marking B Repérage B	(Bauteilende/2. Farbring) = 2. Zahl; (body end or second coloured ring) = 2nd digit; (bout du corps ou 2e anneau) = 2e chiffre;
Kennzeichen C Marking C Reperage C	(Punkt/3. Farbring) = 3. Zahl = Zahl der Nullen; (dot or third coloured ring) = number of zeroes; (point ou 3e anneau) = nombre de zéros;
Kennzeichen D Marking D Reperage D	(Punkt/4. Farbring) = Toleranz des Nennwerts in % (Fehlendes Kennzeichen für D bedeutet ±20%) (dot or fourth coloured ring) = tolerance on nominal value in %. (with no D marking: tolerance ± 20%) (point ou 4e anneau) = tolérance en % de la valeur nominale (L'absence du repérage D signifie ± 20%)

Das Fehlen eines Kennzeichens bedeutet, daß die Farbe des Bauteilkörpers die Wertangabe darstellt
The absence of a marking signifies that the body colour gives the corresponding information
L'absence de tout repérage signifie que la couleur du corps du composant représente la valeur correspondante

*Siehe auch DIN 41 429 und DIN 40 825
see also IEC publication 62-1952 and 62-1968
Voir aussi DIN 41 429 et DIN 40 825

ROHDE&SCHWARZ	ÄZ	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt Page
	10	0684	UIG DC-MIKROVOLTMETER	203.5111.01 SA	1

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
BA1	EB 1,5VRUNDZELLE R20MONOZ BATTERY DURACELL MN1300	EB 017.0015	
BIS/TO BA6			
BU1	FP DIREKTRASTER2,5435KONT KLAR&BEIL STL3/35NR.3.335	018.9439	203.5170
BU2	FP DIREKTRASTER2,5435KONT KLAR&BEIL STL3/35NR.3.335	018.9439	203.5170
BU3	FP DIREKTRASTER2,5435KONT KLAR&BEIL STL3/35NR.3.335	018.9439	203.5170
BU4	VK RAENDELKL.ISOL.ROT KNURLED CLAMP ELMA BV 42267	VK 219.5300	
BU5	VK RAENDELKL.ISOL.SCHWARZ KNURLED CLAMP ELMA BV 42268	VK 219.5316	
BU6	VK RAENDELKL.ISOL.ROT KNURLED CLAMP ELMA BV 42267	VK 219.5300	
BU7	VK RAENDELKL.ISOL.GRAU KNURLED CLAMP ELMA BV 42269	VK 219.5322	
BU8	VK RAENDELKL.ISOL.SCHWARZ KNURLED CLAMP ELMA BV 42268	VK 219.5316	
BU9	VK RAENDELKL.ISOL.ROT KNURLED CLAMP ELMA BV 42267	VK 219.5300	
BU10	BUCHSENLEISTE 7/1 POL. FEMALE MULTIP.CONNECTOR	274.8394	
C1	CK 1,0UF+-10% 63V QUADER CAPACITOR ROEDERST MKT1822-510/06/10%	CK 024.6973	203.5170
C2	CK 1,5UF+-10% 63V QUADER CAPACITOR ROEDERST MKT1822-515/06/10%	CK 024.6980	203.5170
C3	CK 1,0UF+-10% 63V QUADER CAPACITOR ROEDERST MKT1822-510/06/10%	CK 024.6973	203.5170
C4	CK 1,0UF+-10% 63V QUADER CAPACITOR ROEDERST MKT1822-510/06/10%	CK 024.6973	203.5170
C6	CK 47NF+-20%250V QUADER PLASTIC-FOIL CAPACITOR VALVO MKT344/0,047/20/250	CK 006.5162	203.5170
C7	CK 47NF+-20%250V QUADER PLASTIC-FOIL CAPACITOR VALVO MKT344/0,047/20/250	CK 006.5162	203.5170
C9	CE 47 UF-20+50% 6V 9X10TR ELECTROLYTIC CAPACITOR ITT TA-ELK043212-12247	CE 022.9775	203.5170
C10	CE 47 UF-20+50% 6V 9X10TR ELECTROLYTIC CAPACITOR ITT TA-ELK043212-12247	CE 022.9775	203.5170

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
GL1	AE PAD5 45V PICOAMP.DI DIODE SILICONIX PAD5	AE 247.5800	203.5170
GL2	AE PAD5 45V PICOAMP.DI DIODE SILICONIX PAD5	AE 247.5800	203.5170
GL3	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	203.5170
GL4	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	203.5170
GL5	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	203.5170
GL6	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	203.5170
J1	JD 2X1V140X105U SPIEGELSK MOVING-COIL METER	067.7907	
R1	RL 2 W 50 MOHM+-0,1% RESISTOR PYROFILM PME80T-5,50M0,1%	067.7313	203.5170
R2	RL 0,125W 50,25KOHM+-0,1% RESISTOR ELECTR RB60C,50,25K0,1%	067.7307	203.5170
R3	RL 1,0W 1,087MOHM+-0,1%TK VITROHM 402 1,087MOHM 0,1%T9	203.5511	203.5170
R4	RL 0,5W 1 KOHM +-0,1% RESISTOR ELECTR RB70C;1K0,1%	067.7288	203.5170
R5	RD 1 W 1 OHM+-0,1% WIRE-WOUND RESISTOR PREC-RES TX1814,10HM0,1%TK20	067.7394	203.5170
R6	RF 0,5 W 10 KOHM +-5% DEPOS.-CARBON RESISTOR RESISTA SK4/10K5%	RF 007.1490	203.5170
R7	RF 0,5 W 10 KOHM +-5% DEPOS.-CARBON RESISTOR RESISTA SK4/10K5%	RF 007.1490	203.5170
R8	RF 0,5 W 10 KOHM +-5% DEPOS.-CARBON RESISTOR RESISTA SK4/10K5%	RF 007.1490	203.5170
R10	RS 0,75W 1MOHM+-10%CERMET DEPOS.-CARBON POTENTIOMET BOURNS 3006P-1-1 MOHM+-10%	RS 037.7473	203.5170
R11	RF 0,6W 100MOHM+-10% RESISTOR ELECTR AP1/4;100M10%	067.7271	203.5170
R12	RF 0,125W 1GOHM+-30% CARBON RESISTOR ALLEN-BRAD BBH1083 1GOHM 30%	350.2768	203.5170

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R13	RS 1W 1 MOHM KURVE1 L12 DEPOS.-CARBON POTENTIOMET RUF 0620-000/1MLIN	RS 030.6988	
R16	RF 0,75W 15MOHM+-2%TK600 RESISTOR ELECTRON RA70/15M/2%ISO	203.5492	203.5170
R17	RS 1W 1 MOHM KURVE1 L12 DEPOS.-CARBON POTENTIOMET RUF 0620-000/1MLIN	RS 030.6988	
R18	RF 0,25 W 220 KOHM +-2% DEPOS.-CARBON RESISTOR	028.1782	203.5170
R20	RL 0,35W 1MOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1M-F-D	RL 082.7862	203.5170
R21	RL 0,35W 1MOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1M-F-D	RL 082.7862	203.5170
R22	RL 0,35W 1MOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1M-F-D	RL 082.7862	203.5170
R23	RF 0,25 W 1 KOHM +-2% RESISTOR DRALORIC LCA0207/2%1,00K	028.1524	203.5170
R25	RL 0,25W 22,04KOHM+-0,1%T RESISTOR ELECTRON RB60/C/22,04K/0,1%	203.5505	203.5170
R26	RF 0,25 W 1 KOHM +-2% RESISTOR DRALORIC LCA0207/2%1,00K	028.1524	203.5170
R27	RF 0,25 W 2,2 KOHM +-2% RESISTOR DRALORIC LCA0207/2,2K/2%	028.1582	203.5170
R28	RF 0,25 W 6,8 KOHM +-2% RESISTOR DRALORIC LCA0207/6,8K/2%	028.1647	203.5170
R29	RF 0,25 W 22 KOHM +-2% RESISTOR DRALORIC LCA0207/22K/2%	028.1699	203.5170
R30	RF 0,25 W 68 KOHM +-2% RESISTOR DRALORIC LCA0207/2%68,1K	028.1753	203.5170
R35	RF 0,3 W 33 KOHM+-1% RESISTOR BEYSCHLAG SBC0309/33K1%	028.5707	203.5211
R36	RF 0,3 W 33 KOHM+-1% RESISTOR BEYSCHLAG SBC0309/33K1%	028.5707	203.5211
R37	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097	203.5211
R38	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097	203.5211
S1	SD 2EBENEN 1MAL 9 KURZSCH SWITCH SEL SBL11 2 1E25A09K	SD 092.1167	203.5170

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
S2	SD 4EBENEN 1MAL10 KURZSCH ROTARY SWITCH SEL SB11 4 1E35A10K	SD 070.2302	203.5170
S3	SD 1EBENE 3MAL 4 UNTERBR ROTARY SWITCH SEL SB161 3E25A04U ACHS-L=18	070.5060	203.5211
SI1	SS SCHMELZS. 20MILLIA (M) FUSE WICKMANN 0,02AFN1,19201TROP	020.6927	203.5170
SI2	SS SCHMELZS.F1 DIN41661 FUSE WICKMANN F 1 DIN41661 TROP	SS 020.7423	203.5170
ST1	FP WINKELSTECKERLEIST.36P ANGLE PIN CONNECTOR BERG 75168-113-36	FP 243.3578	219.5616
T1	AM BSV81 NKAN 30V MOSF MOS-FET VALVO BSV81	AM 010.9069	203.5170
BIS/TO T4			
Y1	ED WECHSELSPANNUNGSVERST.	203.5263	
Y2	ED ENDVERSTAERKER	203.5286	
Y3	ED REGELTEIL	203.5305	

095.0026-0481

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	05	1279	WECHSELSPANNUNGSVERSTR. Z	203.5263 SA	1

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
A	ZUGEHOERIGER STROMLAUF 203.5263 S		203.5263
C101	CE 220UF-20+50% 3V 9X12TR ERO-TANTAL TA-ELKOETQ-5220/3	CE 022.9730	203.5263
C102	CE 220UF-20+50% 3V 9X12TR ERO-TANTAL TA-ELKOETQ-5220/3	CE 022.9730	203.5263
C103	CE 47 UF-20+50% 6V 9X10TR ITT TA-ELK043212-12247	CE 022.9775	203.5263
C105	CE 47 UF-20+50% 6V 9X10TR ITT TA-ELK043212-12247	CE 022.9775	203.5263
C106	CK 470NF+-20% 63V QUADER ROEDERST MKT1822-447/06	CK 024.6950	203.5263
C107	CC 270PF+-2%6X9N750 DRALORIC EDPU6X9/270/2%N750	CC 087.6958	203.5263
C108	CE 47 UF-20+50% 6V 9X10TR ITT TA-ELK043212-12247	CE 022.9775	203.5263
C110	CE 47 UF-20+50% 6V 9X10TR ITT TA-ELK043212-12247	CE 022.9775	203.5263
C111	CK 1,0UF+-10% 63V QUADER ROEDERST MKT1822-510/06/10%	CK 024.6973	203.5263
C112	CC 270PF+-2%6X9N750 DRALORIC EDPU6X9/270/2%N750	CC 087.6958	203.5263
C113	CC 270PF+-2%6X9N750 DRALORIC EDPU6X9/270/2%N750	CC 087.6958	203.5263
C115	CK 470NF+-20% 63V QUADER ROEDERST MKT1822-447/06	CK 024.6950	203.5263
C116	CE 47 UF-20+50% 6V 9X10TR ITT TA-ELK043212-12247	CE 022.9775	203.5263
C117	CC 270PF+-2%6X9N750 DRALORIC EDPU6X9/270/2%N750	CC 087.6958	203.5263
C118	CE 47 UF-20+50% 6V 9X10TR ITT TA-ELK043212-12247	CE 022.9775	203.5263
C120	CK 1,0UF+-10% 63V QUADER ROEDERST MKT1822-510/06/10%	CK 024.6973	203.5263
C121	CK 1,0UF+-10% 63V QUADER ROEDERST MKT1822-510/06/10%	CK 024.6973	203.5263
C122	CC 330PF+-2%6X9N750 DRALORIC EDPU6X9/330/2%N750	CC 087.6964	203.5263
C123	CC 330PF+-2%6X9N750 DRALORIC EDPU6X9/330/2%N750	CC 087.6964	203.5263
C124	CC 330PF+-2%6X9N750 DRALORIC EDPU6X9/330/2%N750	CC 087.6964	203.5263
C125	CC 330PF+-2%6X9N750 DRALORIC EDPU6X9/330/2%N750	CC 087.6964	203.5263
R101	RF 0,25W 1 MOHM +-5% DRALORIC LCA0207/+-5%1,0M	RF 069.1058	203.5263
R102	RF 0,25W 1 MOHM +-5% DRALORIC LCA0207/+-5%1,0M	RF 069.1058	203.5263
R103	RF 0,25W 12KOHM +-5% DRALORIC LCA0207/+-5%12K	RF 069.1235	203.5263
R104	RF 0,25W 22KOHM +-5% DRALORIC LCA0207/+-5%22K	RF 069.2231	203.5263
R105	RF 0,25W 22KOHM +-5% DRALORIC LCA0207/+-5%22K	RF 069.2231	203.5263

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ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	05	1279	WECHSELSPANNUNGSVERSTR. Z	203.5263 SA	2

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
R106	RF 0,25 W 180 OHM +-2%	028.1430	203.5263
R107	RF 0,25 W 180 OHM +-2%	028.1430	203.5263
R108	RF 0,25W 39KOHM +-5%	RF 069.3938	203.5263
	DRALORIC LCA0207/+-5%39K		
R110	RF 0,25W 39KOHM +-5%	RF 069.3938	203.5263
	DRALORIC LCA0207/+-5%39K		
R111	RF 0,25 W 12 KOHM +-2%	028.1660	203.5263
	DRALORIC LCA0207/12K/2%		
R112	RF 0,25 W 12 KOHM +-2%	028.1660	203.5263
	DRALORIC LCA0207/12K/2%		
R113	RF 0,25W180KOHM +-5%	RF 069.1841	203.5263
	DRALORIC LCA0207/+-5%180K		
R114	RF 0,25W100KOHM +-5%	RF 069.1041	203.5263
	DRALORIC LCA0207/+-5%100K		
R115	RF 0,25W180KOHM +-5%	RF 069.1841	203.5263
	DRALORIC LCA0207/+-5%180K		
R116	RF 0,25W 68KOHM +-5%	RF 069.6837	203.5263
	DRALORIC LCA0207/+-5%68K		
R117	RF 0,25W470 OHM +-5%	RF 069.4711	203.5263
	DRALORIC LCA0207/+-5%470		
R118	RF 0,25W470 OHM +-5%	RF 069.4711	203.5263
	DRALORIC LCA0207/+-5%470		
R119	RF 0,25W100KOHM +-5%	RF 069.1041	203.5263
	DRALORIC LCA0207/+-5%100K		
R120	RF 0,25W180KOHM +-5%	RF 069.1841	203.5263
	DRALORIC LCA0207/+-5%180K		
R121	RF 0,25W180KOHM +-5%	RF 069.1841	203.5263
	DRALORIC LCA0207/+-5%180K		
R122	RF 0,25W100KOHM +-5%	RF 069.1041	203.5263
	DRALORIC LCA0207/+-5%100K		
R123	RF 0,25W120KOHM +-5%	RF 069.1241	203.5263
	DRALORIC LCA0207/+-5%120K		
R125	RF 0,25 W 2,2 KOHM +-2%	028.1582	203.5263
	DRALORIC LCA0207/2,2K/2%		
R126	RF 0,25W 68KOHM +-5%	RF 069.6837	203.5263
	DRALORIC LCA0207/+-5%68K		
R127	RF 0,25W100KOHM +-5%	RF 069.1041	203.5263
	DRALORIC LCA0207/+-5%100K		
R128	RF 0,25 W 82 KOHM +-2%	037.4616	203.5263
R130	RF 0,25W150KOHM +-5%	RF 069.1541	203.5263
	DRALORIC LCA0207/+-5%150K		
R131	RF 0,25W470 OHM +-5%	RF 069.4711	203.5263
	DRALORIC LCA0207/+-5%470		
R132	RF 0,25 W 1 MOHM +-2%	RF 067.7259	203.5263
	DRALORIC LCA0207/2%1,00M		
R133	RF 0,25W470 OHM +-5%	RF 069.4711	203.5263
	DRALORIC LCA0207/+-5%470		
R134	RF 0,25W180KOHM +-5%	RF 069.1841	203.5263
	DRALORIC LCA0207/+-5%180K		
R135	RF 0,25W100KOHM +-5%	RF 069.1041	203.5263
	DRALORIC LCA0207/+-5%100K		
R136	RF 0,25W180KOHM +-5%	RF 069.1841	203.5263
	DRALORIC LCA0207/+-5%180K		
R137	RF 0,25 W 18 KOHM +-2%	028.1682	203.5263
R138	RF 0,25 W 18 KOHM +-2%	028.1682	203.5263
R140	RF 0,25 W 82 KOHM +-2%	037.4616	203.5263
R141	RF 0,25W 68KOHM +-5%	RF 069.6837	203.5263

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Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
	DRALORIC LCA0207/+-5%68K		
R142	RF 0,25W270KOHM +-5%	RF 069.2748	203.5263
	DRALORIC LCA0207/+-5%270K		
R143	RF 0,25W270KOHM +-5%	RF 069.2748	203.5263
	DRALORIC LCA0207/+-5%270K		
R144	RF 0,25 W 150 KOHM +-2%	028.1776	203.5263
	DRALORIC LCA0207/150K/2%		
R145	RF 0,25 W 82 KOHM +-2%	037.4616	203.5263
R146	RF 0,25W100KOHM +-5%	RF 069.1041	203.5263
	DRALORIC LCA0207/+-5%100K		
R148	RF 0,25W100KOHM +-5%	RF 069.1041	203.5263
	DRALORIC LCA0207/+-5%100K		
R149	RF 0,25W470 OHM +-5%	RF 069.4711	203.5263
	DRALORIC LCA0207/+-5%470		
R150	RF 0,25W470 OHM +-5%	RF 069.4711	203.5263
	DRALORIC LCA0207/+-5%470		
T101	AK 2N 3964 SI PNP45V 0,1A	010.2812	203.5263
	INTERMETAL TRANSISTOR2N3964		
T102	AK 2N 3964 SI PNP45V 0,1A	010.2812	203.5263
	INTERMETAL TRANSISTOR2N3964		
T103	AK BC173C SI NPN 20V 0,1A	010.4444	203.5263
	ITT TRANSISTORBC173C		
T104	AK BC173C SI NPN 20V 0,1A	010.4444	203.5263
	ITT TRANSISTORBC173C		
T106	AK BC173C SI NPN 20V 0,1A	010.4444	203.5263
	ITT TRANSISTORBC173C		
T107	AK BC 253C SI PNP 20V0,1A	010.2829	203.5263
	INTERMETAL TRANSISTORBC253C		
T108	AK BC173C SI NPN 20V 0,1A	010.4444	203.5263
	ITT TRANSISTORBC173C		
T109	AK BC 253C SI PNP 20V0,1A	010.2829	203.5263
	INTERMETAL TRANSISTORBC253C		
T110	AK BC173C SI NPN 20V 0,1A	010.4444	203.5263
	ITT TRANSISTORBC173C		
T111	AK BC173C SI NPN 20V 0,1A	010.4444	203.5263
	ITT TRANSISTORBC173C		
T113	AK BC 253C SI PNP 20V0,1A	010.2829	203.5263
	INTERMETAL TRANSISTORBC253C		
T114	AK BC 253C SI PNP 20V0,1A	010.2829	203.5263
	INTERMETAL TRANSISTORBC253C		
T115	AK BC173C SI NPN 20V 0,1A	010.4444	203.5263
	ITT TRANSISTORBC173C		
T116	AK BC 253C SI PNP 20V0,1A	010.2829	203.5263
	INTERMETAL TRANSISTORBC253C		
T118	AK BC173C SI NPN 20V 0,1A	010.4444	203.5263
	ITT TRANSISTORBC173C		
T119	AK BC173C SI NPN 20V 0,1A	010.4444	203.5263
	ITT TRANSISTORBC173C		
T120	AK BC 253C SI PNP 20V0,1A	010.2829	203.5263
	INTERMETAL TRANSISTORBC253C		
T122	AK BC 253C SI PNP 20V0,1A	010.2829	203.5263
	INTERMETAL TRANSISTORBC253C		
T123	AK BC 253C SI PNP 20V0,1A	010.2829	203.5263
	INTERMETAL TRANSISTORBC253C		
T124	AK BC 253C SI PNP 20V0,1A	010.2829	203.5263
	INTERMETAL TRANSISTORBC253C		
			- ENDE -

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ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	03	0778	ENDVERSTAERKER Z	203.5286 SA	1

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
A	ZUGEHOERIGER STROMLAUF 203.5286 S	999.9810	203.5286
F C201	RICHTIGE SNR 022.9852	022.8462	203.5286
C203	CK 3,3UF+-20% 63V RD9X25	CK 024.8699	203.5286
R201	RF 0,25 W 150 KOHM +-2%	028.1776	203.5286
R202	RF 0,25 W 150 KOHM +-2%	028.1776	203.5286
R203	RF 0,25 W 82 KOHM +-2%	037.4616	203.5286
R205	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.5286
R206	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.5286
R207	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.5286
R208	RS 0,5W220KOHM+-20%LIN PI	RS 066.8874	203.5286
R210	RF 0,25 W 220 KOHM +-2%	028.1782	203.5286
R211	RF 0,25 W 1 KOHM +-2%	RF 028.1524	203.5286
R212	RF 0,25 W 330 KOHM +-2%	RF 067.7236	203.5286
R213	RF 0,25W 82KOHM +-5%	RF 069.8230	203.5286
R214	RF 0,25W120KOHM +-5%	RF 069.1241	203.5286
R215	RF 0,25W 39KOHM +-5%	RF 069.3938	203.5286
R217	RF 0,25 W 12 KOHM +-2%	028.1660	203.5286
R218	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.5286
R219	RF 0,25 W 12 KOHM +-2%	028.1660	203.5286
R220	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.5286
R222	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.5286
R223	RF 0,25 W 12 KOHM +-2%	028.1660	203.5286
R224	RF 0,25W 1 MOHM +-5%	RF 069.1058	203.5286
R225	RF 0,25 W 12 KOHM +-2%	028.1660	203.5286
R227	RL 0,125W 100 KOHM +-0,1%	067.7342	203.5286
R228	RL 0,125W 320,410HM+-0,1%	067.7413	203.5286
R229	RL 0,15W6,8377KOHM+-0,1%	067.7336	203.5286
R230	RL 0,15W2,1623KOHM+-0,1%	067.7365	203.5286
R231	RL 0,125W 683,770HM+-0,1%	067.7371	203.5286
R232	RL 0,125W 216,230HM+-0,1%	067.7388	203.5286
R233	RL 0,125W 100,000HM+-0,1%	067.7359	203.5286
T201	AM BF244A N-KANAL-FET 30V	010.8510	203.5286
T202	AM BF244A N-KANAL-FET 30V	010.8510	203.5286
T205	AK TD101 SI NPN 30V DUAL	010.6801	203.5286
T206	AK BC 253C SI PNP 20V0,1A	010.2829	203.5286
T207	AK BC 253C SI PNP 20V0,1A	010.2829	203.5286
T208	AK BC173C SI NPN 20V 0,1A	010.4444	203.5286
T209	AK BC173C SI NPN 20V 0,1A	010.4444	203.5286
T210	AK BC 253C SI PNP 20V0,1A	010.2829	203.5286

- ENDE -

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
A	ZLGEHOERIGER STROMLAUF 2C3.53C5 S		
C3C3	CK 10NF+-2C%1CCV RM7,5KG PLASTIC-FOIL CAPACITOR RCEDERST KC1848-31C/C	CK C06.452C	
C3C4	CK 2,2NF+-20%160V RM7,5KC PLASTIC-FOIL CAPACITOR ROEDERST KC1848-222/1	CK C06.4614	
C3C5	CK 1CNF+-2C%1CCV RM7,5KG PLASTIC-FOIL CAPACITOR ROEDERST KC1848-310/0	CK C06.4520	
C3C6	CE 47 UF-2C+50% 6V 9X1CTR ELECTROLYTIC CAPACITOR ITT TA-ELKO43212-12247	CE C22.9775	
C3C7	CE 47 UF-2C+5C% 6V 9X1CTR ELECTROLYTIC CAPACITOR ITT TA-ELKO43212-12247	CE 022.9775	
C310	CK 47ONF+-2C% 63V QUADER CAPACITOR RCEDERST MKT1822-447/C6	CK 024.6950	
C311	CK 22CPF+-20%160V RM7,5KC PLASTIC-FOIL CAPACITOR RCEDERST KC1848-122/1	CK 006.4550	
C312	CK 1CNF+-1% 63V RD 7X18KS CAPACITOR SCHUEMANN CKS10000/1/63/4C	CK C24.4593	
C313	CK 1,0NF+-2,5%63V 4,7RD PLASTIC-FOIL CAPACITOR SIEMENS B31063-A5102-H	CK C60.4790	
C315	CK 1,0NF+-2,5%63V 4,7RD PLASTIC-FOIL CAPACITOR SIEMENS B31063-A5102-H	CK 060.4790	
C316	CK 22CPF+-20%16CV RM7,5KC PLASTIC-FOIL CAPACITOR RCEDERST KC1848-122/1	CK C06.4550	
C317	CK 1CNF+-1% 63V RD 7X18KS CAPACITOR SCHUEMANN CKS1CCCC/1/63/4C	CK C24.4593	
C318	CK 47CNF+-20% 63V QUADER CAPACITOR RCEDERST MKT1822-447/C6	CK C24.6950	
GL3C1	AD 1N4448 SI 75V 150MIA DICDE 1N4448 VALVC 1N4448	AD 012.0700	
GL3C2	AD 1N4448 SI 75V 150MIA DICDE 1N4448 VALVC 1N4448	AD 012.0700	
R3C1	RF 0,25W100KOHM +-5% RESISTOR DRALORIC LCA0207/+-5%100K	RF C69.1041	
R3C2	RF 0,25W270KOHM +-5% RESISTOR DRALORIC LCAC207/+-5%270K	RF 069.2748	

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R3C3	RS C,5W100KOHM+-20%LIN PI DEPOS.-CARBON POTENTIOMET RLF 0650-310-100KOHM LIN	RS C66.8868	
R3C4	RF C,25 W 120 KOHM +-2% RESISTOR DRALORIC LCA0207/2%121K	C67.7220	
R3C5	RF 0,25 W 33C KOHM +-2% RESISTOR DRALORIC LCA0207/2%332K	RF C67.7236	
R3C7	RF 0,25W22CKOHM +-5% RESISTOR DRALORIC LCAC207/+-5%22CK	RF C69.2248	
R3C8	RF 0,3 W 220 KOHM+-1% RESISTOR BEYSCHLAG SBCC309/220K1%	C28.6149	
R310	RF C,25W27CKOHM +-5% RESISTOR DRALORIC LCAC207/+-5%27CK	RF C69.2748	
R312	RF C,25W100KOHM +-5% RESISTOR DRALORIC LCA0207/+-5%1CCK	RF C69.1041	
R313	RF 0,25W27CKOHM +-5% RESISTOR DRALORIC LCA0207/+-5%27CK	RF C69.2748	
R314	RF C,25W10CKOHM +-5% RESISTOR DRALORIC LCAC207/+-5%100K	RF C69.1041	
R315	RF 0,25W39CKOHM +-5% RESISTOR DRALORIC LCAC207/+-5%39CK	RF C69.3944	
R317	RF C,25W22CKOHM +-5% RESISTOR DRALORIC LCAC207/+-5%22CK	RF C69.2248	
R318	RF C,3 W 220 KOHM+-1% RESISTOR BEYSCHLAG SBCC309/220K1%	C28.6149	
R320	RF 0,25W220KOHM +-5% RESISTOR DRALORIC LCA0207/+-5%22CK	RF C69.2248	
R321	RF 0,25W 27 KOHM+-2% RESISTOR DRALORIC LCAC207/27K/2%	C28.1701	
R322	RF C,5W 82CKOHM+-1% RESISTOR RESISTA SK4/820K1%	C29.0444	
R323	RF C,25W 1 MOHM +-5% RESISTOR DRALORIC LCA0207/+-5%1,CM	RF C69.1058	
R325	RF C,25W 1CKOHM +-5% RESISTOR DRALORIC LCAC207/+-5%1CK	RF C69.1035	
R326	RF C,25 W 150 KOHM +-2% RESISTOR DRALORIC LCAC207/150K/2%	C28.1776	
R327	RF C,25 W 15C KOHM +-2% RESISTOR DRALORIC LCAC207/150K/2%	C28.1776	

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R33C	RF 0,25W 27 KOHM+-2% RESISTOR DRALORIC LCAC207/27K/2%	028.1701	
R331	RF 0,5W 820KOHM+-1% RESISTOR RESISTA SK4/820K1%	029.0444	
R332	RF 0,25W 1 MOHM +-5% RESISTOR DRALORIC LCAC207/+-5%1,0M	RF C69.1058	
R333	RF 0,25W220KOHM +-5% RESISTOR DRALORIC LCAC207/+-5%220K	RF 069.2248	
R334	RF 0,25W 10KOHM +-5% RESISTOR DRALORIC LCAC207/+-5%10K	RF C69.1035	
T3C1	AK BC 253C SI PNP 20V0,1A TRANSISTOR BC253C INTERMETAL BC253C	C10.2829	
T3C2	AK BC 253C SI PNP 20V0,1A TRANSISTOR BC253C INTERMETAL BC253C	C1C.2829	
T3C3	AK TD101 SI NPN 30V DUAL TRANSISTOR TD1C1 SPRAGUE TD1C1	010.6801	
T3C5	AK BC 253C SI PNP 20V0,1A TRANSISTOR BC253C INTERMETAL BC253C	C10.2829	
T3C6	FELDEFEKT-TRANSISTOR TRANSISTOR	203.5405	
T3C7	AK BC173C SI NPN 20V 0,1A TRANSISTOR BC173C INTERMETAL BC173C	C10.4444	
T3C8	AK BC173C SI NPN 20V 0,1A TRANSISTOR BC173C INTERMETAL BC173C	C10.4444	
T310	AK TD 401 SI PNP DIFVERST TRANSISTOR TD401 SPRAGUE TD401	C10.6818	
T311	AK BC 253C SI PNP 20V0,1A TRANSISTOR BC253C INTERMETAL BC253C	C1C.2829	
T312	AK BC173C SI NPN 2CV 0,1A TRANSISTOR BC173C INTERMETAL BC173C	C10.4444	
T313	AK BC 253C SI PNP 20V0,1A TRANSISTOR BC253C INTERMETAL BC253C	C1C.2829	
T314	AK BC173C SI NPN 2CV 0,1A TRANSISTOR BC173C INTERMETAL BC173C	C10.4444	
			- ENDE -

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Stromläufe
Bestückungspläne
Circuit diagrams
Components plans

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